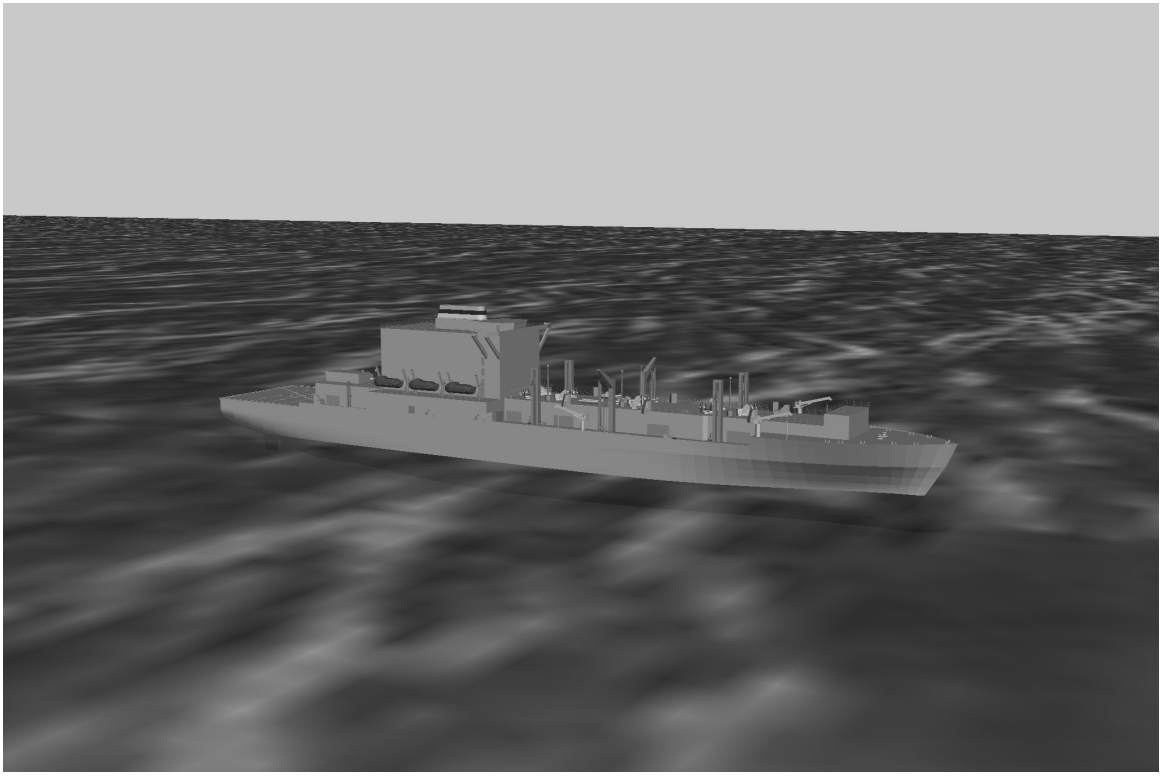
AUXILIARY DRY CARGO SHIP (T-AKE 1)



Navy ACAT ID Program		**Prime Contractor**
Total Number of Systems:	12	TBD
Total Program Cost (TY$):	$4024.7M	
Average Unit Cost (TY$):	$335.4M	
Full-rate production:	N/A	

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2020

The Auxiliary Dry Cargo ship program provides a new multi-product ship class to re-supply Navy combat forces at sea. The ships will replace the existing AFS- and AE-class ships and will provide ammunition, spare parts and provisions (dry, refrigerated and frozen). The primary mission of T-AKE 1 is to provide logistics lift from friendly ports or from specially equipped merchant ships to the battle group replenishment station ships. The T-AKE 1 will be capable of remaining on station with the battle group to fill the station ship role in conjunction with a T-AO-class ship.

The T-AKE 1 supports the ***Joint Vision 2020*** concept of ***focused logistics*** and enables the battle group missions of ***dominant maneuver*** and ***precision engagement***

BACKGROUND INFORMATION

By 2007, all of the Navy's 8-ship AFS-class and 8-ship AE-class will have reached their 35-year design life. A 12-ship T-AKE 1-class is intended to replace these ships, as recommended by the Navy study that serves as the Analysis of Alternatives for the program. The acquisition strategy, approved in April 1999 and subsequently somewhat modified, includes a single Contract Award Milestone (Milestone II-equivalent) DAB review in early FY01. At that time, the intention will be to award the detailed design and construction contract for the lead ship, with priced options for the next seven follow-on ships and not-to-exceed the established priced options for ships 9 through 12. Preliminary design studies conducted by potential ship builders have been completed, identifying innovative concepts for efficiencies with on-board material handling and cargo flow, and proposing life cycle cost savings by reducing manning and improving ship design. A Request For Proposals for the detail design and construction phase of the program was issued in February 2000, and the down-select to a single vendor is anticipated for January 2001.

TEST & EVALUATION ACTIVITY

During FY00, DOT&E has continued to participate actively in the program's working integrated product teams. Program immaturity has limited test planning to preparation of an initial Test and Evaluation Master Plan (TEMP) identifying operational issues and test events and objectives to support an evaluation of T-AKE 1's operational effectiveness and suitability. Concurrent development of the Operational Requirements Documents (ORD) and TEMP continued into FY00. This culminated with ORD approval in December 1999 and initial program TEMP approval in September 2000. However, as a condition for the approval of this TEMP, DOT&E had required that the TEMP be updated and approved prior to the Contract Award Milestone.

In FY99, DOT&E had re-confirmed the T-AKE 1 program designation as a Live Fire Test and Evaluation (LFT&E) oversight program. In FY00, the Navy and DOT&E developed the program LFT&E strategy. The details on implementing this strategy are being developed by the Navy and DOT&E for inclusion in the LFT&E Management Plan. The Management Plan, which is being developed, will describe the LFT&E program and support the waiver from Full-Up, System-Level testing. DOT&E approval of this plan is required prior to the single Milestone Decision. The most significant unresolved issues are associated with defining LFT&E testing requirements.

TEST & EVALUATION ASSESSMENT

The primary goal of the program, as stated in the draft ORD, is to provide effective underway replenishment capacity at the lowest life cycle cost; and, the ships are to be procured as an acquisition reform initiative utilizing commercial practices to the maximum extent deemed prudent. No formal operational testing or assessment is planned before the single FY01 Milestone decision to design and construct up to 12 ships over a seven-year period, but operational assessments are scheduled during the E&MD phase detail design activities. Operational assessment of the adequacy of cargo handling capability may require accreditation of modeling and simulation (M&S) by the Navy's Operational Test and Evaluation Force. To support this, DOT&E is working with the Navy to ensure that the TEMP contains adequate provisions for incorporating results of operational assessments into decisions affecting program execution, including design modifications determined to be required. This activity has not yet begun, and prompt action by the Navy is required to ensure that the operational assessment is adequate to detect inadequacies in cargo handling. Risks associated with flight operations for vertical replenishment

must also be assessed. The required use of Navy standard replenishment rigging reduces risk associated with connected inter-ship replenishment operations. The major M&S concerns to DOT&E revolve around development of and the validation, verification, and accreditation of the modeling of a new contractor-produced intra-ship cargo handling system, which is unique to the design of this platform and vital for it to accomplish its mission. Since the ship hull will likely be based on an existing commercial design, the risk of serious hull and propulsion deficiencies during routine operations are less than the risk for cargo handling at sea. The anticipated TEMP update, required prior to the Contract Award Milestone in early FY01, will update and enhance the M&S program to conduct detailed design analysis and combined DT/OT.

The LFT&E management approach recognizes that the T-AKE 1 will to be built to commercial design standards while having resistance to underwater shock for a very limited number of systems. Recognizing that the issue is not how a system is designed but how it is employed, considerable work needs to be completed to characterize the shock resistance of commercial ship design features. Only limited information is available and little surrogate testing has been performed concerning the ability of a ship's hull structure and modern shipboard equipment, built to commercial standards, to withstand threat weapons effects from underwater shock and hull whipping. A logical starting point for developing an appropriate surrogate test program was a survey of available data on the response to weapons effects of ships built to commercial practice. DOT&E has articulated the importance of this issue, and the Navy conducted a survey. The Navy found that the data available are qualitative in nature and of limited use in developing a surrogate test program. The Navy has proposed a limited test program that focuses on answering T-AKE 1 critical LFT&E issues and fixing modeling weaknesses. The testing and analysis effort does not address perhaps the greatest area of concern for this ship: weapon-induced fires in the vicinity of fuel tanks and ammunition, either stored in magazines or staged for delivery.

CONCLUSIONS AND LESSONS LEARNED

The compressed acquisition strategy for T-AKE 1 provides no opportunity to perform a vulnerability assessment of the offeror's proposed contract designs in advance of the Single Milestone decision. As such, there is little opportunity for OT and LFT&E to affect the ship design. The first chance for LFT&E to affect the design came as a result of a vulnerability assessment of the Government's Point Design in September 2000. This assessment demonstrated the value of performing damage scenario-based engineering analyses of individual weapon attacks early in the acquisition process. As a result of this work, several recommendations were developed for improvement in the design. The Navy has agreed to perform a vulnerability assessment of the contractor's detailed design. However, the current schedule provides for the award of follow-on ships 2 through 4 before the completion of the detail design vulnerability assessment. It is likely, therefore, that only ships 5 through 12 will benefit from vulnerability assessment recommendations that involve hardware or equipment changes. The Navy has agreed to make changes as appropriate and cost effective.